

Application No. 10/633,199
Response to Office Action

Customer No. 01933

Amendments to the Specification:

Please amend the paragraph at page 1, lines 24-26, as follows:

In a circuit comprising an analog circuit portion and a digital circuit portion, electromagnetic interference from the digital circuit portion to the analog circuit portion has ~~been becoming~~ become a serious problem.

Please amend the paragraph at page 6, lines 25 and 26, as follows:

The first conductor 11 and the first and the second ~~anode~~ anodes 12, 13 may be integrally formed of an etched aluminum foil 10 in ~~a form of~~ a metal sheet.

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Please amend the paragraph at page 7, lines 11-24, as follows:

Aluminum (Al), which is a material of the etched aluminum foil 10, is a kind of valve-operational metal. In the present invention, the a valve-operational metal ~~represents such~~ is a metal that, when oxidized, forms an oxide film, which performs a valve operation. Accordingly, the dielectric 30 can be formed by an oxidized aluminum film of the etched aluminum foil 10 as the first conductor 11. Although the thickness of the dielectric 30 is, for example, 1 μ m, it is shown in Figs. 1B and 1C with a thickness more than the actual thickness thereof so as to help in order to facilitate understanding the structural relationship among components of the filter according to the present invention. On the other hand, the second conductor 20 comprises a solid electrolyte layer, a graphite layer, and a silver coating layer formed on the dielectric layer 30 in this order. Although the thickness of the second conductor 20 is, for example, 50 μ m, the ~~the~~ second conductor 20 is also shown in Figs. 1B and 1C with a thickness more than the actual thickness thereof.

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Please amend the paragraph at page 8, lines 9-13, as follows:

~~The~~ As described in detail hereinbelow, the thickness t of the first conductor 11 should be selected to substantially restrict the temperature elevation of the first conductor 11 caused due to heat generation when a DC current flows in the first conductor 11. ~~Now, this will be hereinbelow described in detail.~~

Please amend the paragraph at page 8, lines 13-17 as follows:

The transmission line type noise filter, which is connected between the DC power supply 70 and the LSI chip 80 through the circuit board 90, passes a coming DC current while ~~attenuates~~ attenuating a coming AC current. Namely, the DC current supplied to the LSI chip 80 flows in the etched aluminum foil 10 in the form of a metal sheet.

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Please amend the paragraph at page 8, lines 18-24, as follows:

The DC current is input in the first land 41, passes through the first anode 12, the first conductor 11, and the second anode 13, and is thus output from the second land 42. In this case, Joule ~~heat~~ heating is generated in the etched aluminum foil 10, particularly in the first conductor 11. The temperature of the transmission line type noise filter is therefore increased. The temperature elevation of the transmission line type noise filter causes ~~a matter such that~~ the life of the transmission line type noise filter ~~is~~ to be shortened.

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Please amend the paragraph at page 9, lines 2-13, as follows:

An amount of heat generated in the first conductor 11 is proportional to the resistance of the first conductor 11. When the first conductor 11 is constant in its shape and size in a plan view, the electrical resistance of the first conductor 11 is ~~inverse~~ inversely proportional to the thickness t of the first conductor. Therefore, when the first conductor 11 is increased in its thickness, the heating value generated in the first conductor 11 is decreased. On the other hand, the increased thickness t of the first conductor 11 decreases heat radiation from the first conductor 11. The present inventors have found out an appropriate or adaptable range of the thickness t to balance the heat value generated in the first conductor 11 with the heat value radiated from the first conductor 11. ~~In more concrete~~ More specifically, the adaptable range of the thickness t of the first conductor 11 was determined by the following investigation.

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Please amend the paragraph at page 9, lines 14-24, as follows:

Fig. 3 shows the test results of regarding the temperature elevation of several samples for the first conductor 11. In the test, different samples of the first conductor 11 were made from an etched aluminum foil of the aluminum purity of 99.96 %. The different samples have the same length L of 1 cm, the same width W of 1 cm, and different ~~thickness~~ thicknesses of 0.01 to 5.0 mm. In order to investigate the ~~relations~~ relationship between the thickness t and the temperature elevation, ~~the a~~ DC current of 30A was continuously applied to flow through each of the samples for 60 seconds, which is sufficient for the temperature of each sample to be settled. The test results are shown in Fig. 3. It is noted from Fig. 3 that the thickness t of the first conductor 11 made essentially of aluminum should be ~~selected~~ 2.0 mm or less so as to substantially restrict the temperature elevation.

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Please amend the paragraph at page 10, lines 1-5, as follows:

Consequently, it is noted from Fig. 3 that the thickness t of the first conductor 11 made essentially of tantalum should preferably be ~~selected~~ 1.5 mm or more so as to substantially restrict the temperature elevation. Further, the thickness t of the first conductor 11 made essentially of niobium should preferably be ~~selected~~ 1.0 mm or more.

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Please amend the paragraph at page 10, lines 6-18, as follows:

Fig. 4 shows results from another test for investigating any effect of the length L of the first conductor 11 ~~to~~ on the relationship between the temperature elevation and the thickness t of the first conductor 11. In ~~the~~ this test, different samples were made from an etched aluminum foil of the aluminum purity of 99.96 %. The different samples have different lengths L of 0.5, 1.0, 2.0, and 4.0 cm, the same width W of 1 cm, and different ~~thickness~~ thicknesses of 0.01 to 5.0 mm. ~~The~~ A DC current of 30A was continuously applied to flow through each of the samples for 60 seconds, which is sufficient for the temperature of each sample to be settled. The test results are shown in Fig. 4. It is noted from Fig. 4 that the length L of the first conductor 11 ~~does not~~ has almost no affect ~~to~~ on the relationship between the temperature elevation and the thickness t , and that the thickness t of the first conductor 11 made essentially of aluminum should be ~~selected~~ 2.0 mm or less so as to substantially restrict the temperature elevation.

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Please amend the paragraph at page 10, line 19 to page 11, line 3, as follows:

Fig. 5 shows results from still another test for investigating any effect of the width W of the first conductor 11 to on the relationship between the temperature elevation and the thickness t of the first conductor 11. In ~~the this~~ test, different samples were made from an etched aluminum foil of the aluminum purity of 99.96 %. The different samples have the same length L of 1 cm, different widths W of 0.2, 0.5, 1.0, and 1.5 cm, and different ~~thickness~~ thicknesses of 0.01 to 5.0 mm. The A DC current of 30A was ~~also~~ continuously applied to flow through each of the samples for 60 seconds, which is sufficient for the temperature of each sample to be settled. The test results are shown in Fig. 5. It is noted from Fig. 5 that although difference of the width W of the first conductor 11 affects to the temperature elevation ~~in a region of~~ when thickness t is more than 2.0 mm, the thickness t of the first conductor 11 should be ~~selected~~ 2.0 mm or less so as to substantially restrict the temperature elevation.

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Please amend the paragraph at page 11, lines 4-14 , as follows:

Fig. 6 shows ~~a~~ further test results investigating affect of the DC current applied to the first conductor 11. In ~~the~~ this test, different samples were also made from an etched aluminum foil of the aluminum purity of 99.96 %. The different samples have the same length L of 1 cm, the same width W of 1 cm, and different ~~thickness~~ thicknesses of 0.01 to 5.0 mm. Each of different DC currents of 5A, 10A, and 30A was continuously applied to flow through each of the samples for 60 seconds. The test results are shown in Fig. 6. It is noted from Fig. 6 that although the value of the DC current affects ~~to~~ the temperature elevation ~~in a region~~ of when thickness t is more than ~~2mm~~ 2.0 mm, the thickness t of the first conductor 11 made essentially of aluminum should be ~~selected~~ 2.0 mm or less so as to substantially restrict the temperature elevation.